UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/710,362	11/10/2000	John C. Connolly	PLW 13206	5398

26171 7590 05/22/2003

FISH & RICHARDSON P.C.
1425 K STREET, N.W.
11TH FLOOR
WASHINGTON, DC 20005-3500

EXAMINER
MENEFEE, JAMES A

ART UNIT	PAPER NUMBER
2828	

DATE MAILED: 05/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/710,362	Applicant(s) CONNOLLY ET AL.	
	Examiner James A. Menefee	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *24-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

PAUL IP
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a)☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This action is in reply to the response filed 26 April 2003. Claims 24-34 are pending.

Claim Rejections - 35 USC § 103

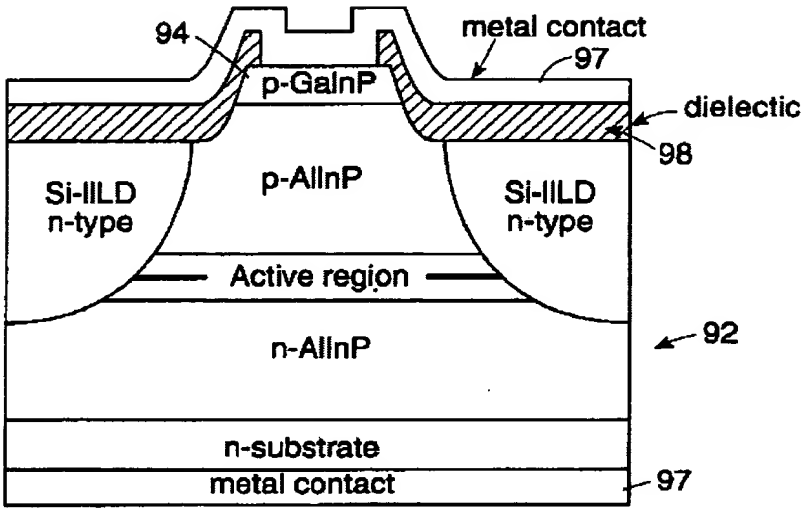
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 24-31 and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beernink et al. (previously cited US 5,717,707) in view of Sun (US 6,044,098).

Regarding claim 24, Beernink discloses, especially in Figs. 11-13 and the discussion thereof on col. 8, a buried ridge waveguide semiconductor laser diode comprising a first cladding layer 95 having a ridge with a first width at the bottom of the ridge, a second cladding layer, an active layer disposed between the first and second cladding layers, a first conductor layer 97 disposed on top of the ridge, and a second conductor (also 97) for conducting current through the active layer. The active layer has a defined gain region (the part marked "Active region") that conducts the current and has a width greater than the width of the bottom of the ridge. There are reduced conductivity regions within the active layer and flanking the defined gain region.

FIG. 13



Beernick discloses that the laser device is a buried ridge type laser. It is not disclosed that the laser should be a ridge waveguide laser. However it is well known that in many applications a ridge waveguide laser and a buried heterostructure laser may be interchangeable. See any of the references cited in this action but not relied upon as evidence of this statement of Official Notice. In these references, it is commonly asserted that for the given invention, embodiments may be made in either of these forms, or it is asserted that either type of laser structure is well known in the art and may be used. Thus, the Examiner contends that the present invention requiring a ridge waveguide type laser does not distinguish over Beernick. Since it has been shown that it is well known that either structure may be used, then an embodiment of Beernick where the laser structure is a ridge-waveguide type would have been an obvious variant of the buried heterostructure laser of Beernick. Further, Sun provides evidence that ridge waveguide type lasers may be advantageous over buried heterostructure lasers (col. 6 lines 24-37). It would thus have been obvious to one skilled in the art, not only that buried heterostructure and ridge

waveguide type lasers may be interchangeably used, but that a ridge waveguide type would be advantageous and thus such a structure should be used in Beernick, because this will lead to improved fabrication thus improving yield, as taught by Sun.

Regarding claim 25, it is disclosed in the background of the invention that these lasers typically have quantum well active regions.

Regarding claims 26-29 and 33, the limitations of these claims are all inherent. The width of the active layer and the nature of the conductivity region will cause all of the limitations of these claims to be met by Beernink's device.

Regarding claim 30, Beernink does not disclose that the active layer is formed of one materials claimed. However, these materials are all well known as used in active layers of semiconductor lasers. It would have been obvious to one having ordinary skill in the art to make the active layer using such materials, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding claim 31, the reduced conductivity regions are implanted with high-energy ions.

Regarding claim 34, Beernink discloses that there may be an insulating layer 98 disposed adjacent the first conductor layer 97.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beernink and Sun as applied to the claims above, and further in view of Nagai et al. (previously cited US 5,469,457). Beernink and Sun teach all of the limitations of the claims as shown above, but does

not disclose the specific energy of the high energy implanted ions. Nagai teaches a device where Si ions (as in Beernink above) are implanted for the same reason as in Beernink, to produce disordered regions where little current flows. Nagai teaches that these ions be implanted at an energy of 150 KeV (col. 9 lines 20-36). It would have been obvious to one skilled in the art to implant the atoms at that energy as the atoms will be sufficient for disordering the quantum wells, and so the upper cladding will not be converted to the same conductivity as the lower cladding, as taught by Nagai.

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection. It is believed that the new rejection makes up for the deficiencies in the previous rejection, as argued by the applicant.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (703) 605-4367. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JM
May 15, 2003

PAUL IP
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800